IN THE CLAIMS:

1. (Currently amended) A method for surface hardening a steel coil spring of a suspension system comprising the steps of:

~~nitriding a surface of said steel coil spring; and~~

determining a type of steel used in the steel coil spring;

selecting a nitriding potential based on the type of steel; and

regulating ~~the~~ a nitriding potential in a nitriding atmosphere, ~~to control the step of nitriding said coil spring, and~~ wherein said ~~the~~ nitriding potential ~~is~~ controls a ~~the~~ tendency of nitrogen to be absorbed by said steel coil spring.

2. (Currently amended) The method as recited in claim 1 wherein the step of regulating said nitriding potential further includes monitoring at least one process parameter, wherein the nitriding atmosphere is regulated based on said at least one process parameter.

3. (Currently amended) The method as recited in claim 1 wherein the regulating step ~~of nitriding said coil spring further~~ includes the step of introducing ammonia into said nitriding atmosphere, wherein an amount of the ammonia is selected based on the nitriding potential.

4. (Original) The method as recited in claim 1 further comprising the steps of:

cleaning said surface of said coil spring;

heating said coil spring; and

cooling said coil spring.

5. (Original) The method as recited in claim 4 wherein the step of heating said coil spring includes heating said nitriding atmosphere to a temperature between 380°C and 480°C.

6. (Currently amended) The method as recited in claim 1 wherein the selecting step ~~of nitriding said coil spring~~comprises selecting the nitriding potential that produces a diffusion zone having a thickness between 30 μm and 100 μm in the coil spring.

7. (Currently amended) The method as recited in claim 1 wherein the ~~step of nitriding~~ nitriding potential is selected to said coil spring further includes ~~forming~~ form a compound layer on ~~said a~~ surface of said coil spring ~~having a thickness between 0 and 2 μm~~.

8. (Currently amended) The method as recited in claim 1 further comprising the step of shot peening ~~said a~~ surface of said coil spring.

9. (Currently amended) The method as recited in claim 8 wherein the step of shot peening said surface of said coil spring includes first shot peening said surface of said coil spring with a .8 mm diameter shot and then secondly shot peening said surface of said coil spring with a .3 mm diameter shot.

10. (Currently amended) A method for surface hardening a steel coil spring of a suspension system comprising the steps of:

cleaning said surface of said coil spring;

heating said coil spring;

~~nitriding a surface of said coil spring;~~

determining a type of steel used in the steel coil spring;

selecting a nitriding potential based on the type of steel;

regulating ~~a~~ the nitriding potential in a nitriding atmosphere ~~to control the step of nitriding said coil spring;~~ , wherein the ~~said~~ nitriding potential ~~being the~~controls a tendency of nitrogen to be absorbed by said steel coil spring;

controlling said step of regulating said nitriding potential with a computer;

cooling said coil spring; and

shot peening ~~said~~ a surface of said coil spring.

11. (Currently amended) A steel coil spring of a suspension system comprising:

a steel body portion having a surface; and

a diffusion zone produced by nitriding said surface ~~of said coil spring~~ by regulation of a nitriding potential in a nitriding atmosphere, wherein the nitriding potential has a value corresponding to a type of steel in the steel coil spring.

12. (Currently amended) The coil spring as recited in claim 11 wherein said surface ~~of said coil spring~~ is nitrided by introducing ammonia into ~~a~~ the nitriding atmosphere, wherein an amount of the ammonia is selected based on the nitriding potential.

13. (Currently amended) The coil spring as recited in claim 11 wherein the ~~a~~ nitriding atmosphere is heated to a temperature between 380°C and 480°C.

14. (Previously presented) The coil spring as recited in claim 11 wherein said diffusion zone has a thickness between 30 μm and 100 μm.

15. (Previously presented) The coil spring as recited in claim 11 wherein said coil spring further includes a compound layer having a thickness between 0 and 2 μm.

16. (Previously presented) The method as recited in claim 1 wherein the step of regulating said nitriding potential is controlled by a computer.

17. (Previously presented) The method as recited in claim 4 where in the step of cleaning said surface of said coil spring includes employing hydrochloric acid.

18. (Currently amended) The method as recited in claim 3 wherein the regulating step ~~of~~ comprises introducing ~~ammonia into said nitriding atmosphere includes introducing said the~~ ammonia into said nitriding atmosphere for 3 to 8 hours.

19. (Previously presented) The method as recited in claim 1 wherein said steel coil spring includes aluminum.

20. (Currently amended) The method as recited in claim 10 ~~where in~~ wherein the step of cleaning said surface of said coil spring includes employing hydrochloric acid.

21. (Currently amended) The method as recited in claim 10 wherein the regulating step ~~comprises of nitriding said coil spring further includes the step of~~ introducing the ammonia into said nitriding atmosphere for 3 to 8 hours.

22. (Previously presented) The method as recited in claim 10 wherein said steel coil spring includes aluminum.

23. (Previously presented) The method as recited in claim 11 wherein said steel coil spring includes aluminum.